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ABSTRACT

This paper describes the experiences of four university teacher education institutions collaborating in an European Union-funded project called the REFLECT project: the Universities of Barcelona (Spain), Exeter (England), Trondheim (Norway), and Utrecht (Netherlands). The project s focus is on the development of reflective competencies in preservice and beginning teachers using various modes of distance education, especially remote computer conferencing or "tele-guidance." In this partnership, the participants collaborate on two levels: first, collaboration between teacher-educators developing a pedagogy of tele-teaching and, second, collaboration between university teachers and student teachers during preservice teaching experiences. Each institution used a different theoretical model to develop reflectivity and different electronic delivery modes varying from video conferencing to one-to-one e-mail. All tele-tutoring was embedded in regular teacher training. The Dutch experiences indicated that an established organization with common standards for the exchange of messages is a critical condition for a well-functioning computer conference. The Exeter experiences focused on analysis of teaching of the subject versus analysis of performance in the communications process. The Utrecht project focused on reflection as part of a problem solving process and the Barcelona project on the degree to which teachers critically reflect on values embedded in their thinking and practice. Results of a survey of telecommunications use in European teacher education are also reported. (Contains 43 references.) (JLS)

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PARTNERSHIP AND COOPERATION AT TWO LEVELS: TELE-GUIDANCE IN TEACHER EDUCATION

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SUMMARY

There is a great interest in Europe in the use of tele-tutoring in teacher education to promote reflection of student teachers. There is much confusion in literature about the precise meaning of the term of reflection and it is often poorly defined by researchers. Using tele-guidance for developing reflection demands pedagogical strategies of tele-teaching which are still in an early stage of development. It is encouraging that in at least 20 sites across Europe, teacher educators currently pursue research in the field of reflection and tele-guidance. Most of these projects have started recently and final results are not yet available.

This paper describes the experiences of four university teacher education institutions collaborating in a EU-funded project, called the REFLECT Project. In this partnership, the participants collaborate at two levels. The first is concerning the collaboration between the teacher educators, aiming at formulating their theoretical frameworks and trying to find elements for a pedagogy of tele-teaching. The second level relates to the cooperation between university teachers and student teachers during school practice. Each of the partners carry out a case study, using a different theoretical framework and using various modes of communication varying from video conferencing to one-to-one e-mail. Preliminary observations and findings show interesting issues on common elements in theoretical frameworks used and pedagogical strategies. Tele-tutoring seems to offer exciting opportunities for student teachers to share their experiences and teacher educators are defining the added value of their efforts to include telematics as an aid to reflection.

1 THE REFLECT PROJECT

At IVLOS, Institute of Education, tele-tutoring of student teachers during school based practice was introduced in 1995. The aim of using asynchronous computer conferencing was to provide an additional tool in the development of reflection of the student teachers. Results of the first-year experiment[1] indicated that tele-tutoring offers opportunities for teacher education, and it has been decided to continue the research activities in this field within the REFLECT Project.

The REFLECT Project, started in January 1996, is an EU-funded one-year international project, in which four university teacher training institutions cooperate in their research on the development of reflective competencies, using various modes of tele-tutoring. The partners (the Universities of Barcelona, Exeter, Trondheim and Utrecht) contribute to the project by each carrying out a four-month case study within their institutions.

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[1] Veen W., Lockhorst D., & Korthagen F. (1995). Tele tutoring in teacher education: a listserv facility as an aid to reflection. *Proceedings of the Open Classroom Conference: Distance learning and new technologies in school level education and training.* Oslo: NKS Distance Education. (Downloadable from http://www.ruu.nl/ivlos/reflect/index.htm)

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The four case studies focus on describing and exploring the effects of telematic learning environments on the development of reflective competencies. In the case studies instruments for the measurement of reflective skills will be developed and the telematic interventions of teacher trainers and the telematic reactions of peer student teachers in the reflection process will be categorized. By collecting data on the interventions of the tutors, the research will contribute to the development of a pedagogy of tele-tutoring.

The empirical studies vary on several conditions such as:

- Technology used: asynchronous computer conferencing, one-to-one electronic mail, or synchronous one-to-one communication using desktop conferencing
- theoretical frameworks of reflection
- variables resulting from differences in educational systems, educational levels (primary and secondary), and cultural backgrounds.

In addition, the REFLECT project includes an inventorial study of research activities in the field of tele-tutoring and reflection which will be described below.
This paper describes (a) the various theoretical frameworks used by the REFLECT partners, (b) the various case studies carried out by the four partners, and (c) the results of the inventorial study. The description shows the situation at the time of writing - providing some preliminary observations and findings. Final results of the research will be available by the end of 1996.

2 THE THEORETICAL FRAMEWORK

As Calderhead (1989) states, there is much confusion in literature about the precise meaning of the concept of reflection and it is often poorly defined by researchers (see also Tom, 1985). Almost all researchers agree on the fact that reflection is a special form of thought (Grimmett, 1988; Sparks-Langer & Colton, 1991; Hatton & Smith, 1995) and that its origin can be traced back to the work of Dewey (1933), who warned against a too mechanical focus on teaching method in the preparation of teachers (Gore, 1987; Zeichner, 1982). Dewey emphasised that 'reflection involves not simply a sequence of ideas, but a *consequence* - a consecutive ordering in such a way that each idea determines the next as its proper outcome, while each outcome in turn leans back on, or refers to, its predecessors' (Dewey, 1933, p.4). In this respect, reflection entails a 'chain of thoughts which aim at a common end' (ibid. p.5). Dewey arrives at the following definition:

> 'Active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusions to which it tends, constitutes reflective thought' (ibid. p.9).

Pollard & Tann (1995) identify six key characteristics in Dewey's notion of reflective action:

1. Reflective teaching implies an active concern with aims and consequences, as well as means and technical efficiency.
2. Reflective teaching is applied in a cyclical or spiralling process, in which teachers monitor, evaluate and revise their own practice continuously.
3. Reflective teaching requires competence in methods of classroom enquiry, to support the development of teaching competence.
4. Reflective teaching requires attitudes of open-mindedness, responsibility and wholeheartedness.
5. Reflective teaching is based on teacher judgement, which is informed partly by self-reflection and partly by insights from educational disciplines.
6. Reflective teaching, professional learning and professional fulfillment are enhanced through collaboration and dialogue with colleagues.

Particularly the sixth characteristic was a major incentive for the REFLECT project. Telematic facilities offer new and important opportunities for collaboration and dialogue with peer student teachers and supervisors and thus for the promotion of reflective teaching.

Different conceptualisations

In spite of the common origin of many conceptualisations of reflection, modern views of reflection differ substantially, if made explicit at all. The terms reflection or reflective teaching are often ill-defined and seem to embrace a wide range of concepts and strategies (Hatton & Smith, 1995), which differ on a number of issues, one of which is the underlying philosophy of education (Korthagen & Wubbels, 1995). We present some examples.

In the approach which sees reflection as critical inquiry, advocated by such authors as Zeichner (1983), and Carr & Kemmis (1986), the objects of reflection are primarily the moral, ethical, political, and instrumental issues embedded in teachers' everyday thinking and practice. Established patterns used in teaching situations are not taken for granted, but are made explicit. It is fairly clear that these authors see a good teacher as a critical, inquiring professional. This view is linked to a specific view of the aims of education in schools, i.e. to make students critical, responsible citizens.

Ross (1987) relates reflection to rationality and responsibility; in her view reflection is a way of thinking about educational matters which involves the ability to make rational choices, and to assume responsibility for those choices. In this respect, she appears to see the teacher as a professional who is accountable for the way he or she teaches.

In the approach employed by Cruickshank et al. (1981), the object of reflection is the effectiveness of instructional strategies in attaining given ends. This technical approach is most probably based on a view of the teacher as a competent, highly technical person (see Gore, 1987), although the authors also state that the aim is to develop in students good habits of thought about teaching, so that they become wise as teachers. It is not clear what their underlying view of education is. It could be a technical and instrumental philosophy of education, which regards mastery of skills by the students as the primary aim of education.

For Schön (1983, 1987) reflection involves some form of experimentation, in which practitioners constantly interpret situations by means of problem-setting and problem-solving, a process which can lead to a reframing of the situation. Schön's descriptions do not make explicit his philosophy of education. It is conceivable that he stresses the experimental nature of good teaching, and does not attach a particularly high value to teachers' use of the theoretical underpinnings of their teaching.

Regardless of whether an author explicitly states his or her educational views, it is clear from the above examples that statements about the nature of reflection are linked to philosophies of education. This explains the wide variety of conceptualisations of reflection.

Only a few attempts have been made to operationalise and measure reflection (Wubbels & Korthagen, 1990; Korthagen, 1993a). There are hardly any studies which link reflective capacities to other teacher characteristics (Korthagen & Wubbels, 1995).

Aims of promoting reflection in teacher education

Calderhead and Gates (1993) state that teacher education programmes based on notions of reflective practice espouse one or more of the following aims:

- to enable teachers to analyze, discuss, evaluate and change their own practice, adopting an analytical approach towards teaching;
- to foster teachers' appreciation of the social and political contexts in which they work, helping teachers to recognize that teaching is socially and politically situated and that the teacher's task involves an appreciation and analysis of that context;
- to enable teachers to appraise the moral and ethical issues implicit in classroom practices, including the critical examination of their own beliefs about good teaching;
- to encourage teachers to take greater responsibility for their own professional growth and to acquire some degree of professional autonomy;
- to facilitate teachers' development of their own theories of educational practice, understanding and developing a principled basis for their own classroom work;
- to empower teachers so that they may better influence future directions in education and take a more active role in educational decision-making.

Apart from the confusion about the precise meaning of the term reflection, this variety of different possible aims contributes to the large number of possible approaches towards the promotion of reflection in teacher education.

Different approaches, theoretically and practically

Many different psychological or educational theories underlying the use of reflection in teacher education are possible and useful. This becomes clear when, for example, one considers the theoretical underpinnings of the different approaches within the REFLECT project. One of the interesting results of the REFLECT project until now has been that the theoretical frameworks of the partners are being discussed and compared. Although the models or tools for promoting reflection of the four partners differ, there are similarities in the theoretical underpinnings and the partners have agreed on a common working definition of reflection. This definition in itself is a continuous object for a stimulating discussion and reflection among the researchers. Before turning to this common core of the REFLECT project, we will first describe the differences between the four partners with regard to the aims of reflection and theoretical underpinnings.

The Utrecht approach

In the Utrecht approach, reflection is considered as part of a problem solving process (Korthagen, 1985; Calderhead, 1989). In line with Schön (1983, 1987) the Utrecht teacher educators consider reflection to be related to experimentation, in which practitioners constantly interpret situations by means of problem-setting and problem-solving. The problem-setting and problem-solving process may take place within a group, during a supervisory conference, while writing a logbook, etcetera. Its essence is an attempt to structure or restructure an experience (Schön, 1983, 1987; De Jong & Korthagen, 1989; Korthagen, 1992).

Korthagen (1985) describes the process of reflection in terms of a spiral model, consisting of cycles of 5 phases (figure 1). In this model, phase 5 is the first step of a next cycle.

This ALACT model is the basis for a preservice teacher education programme aiming at the development of reflective teachers in the Netherlands. The programme has been the object of many research studies (Korthagen, 1985; Korthagen, 1988; Wubbels & Korthagen, 1991; Korthagen, 1993a).

The Utrecht view is based on a system approach towards classroom communication (Watzlawick et al., 1967). Interaction processes in the classroom are considered to take place within a social system with at least two important components: the student teacher and the pupils/students. The behaviour of both the student teacher and the pupils is seen as being closely interrelated: the

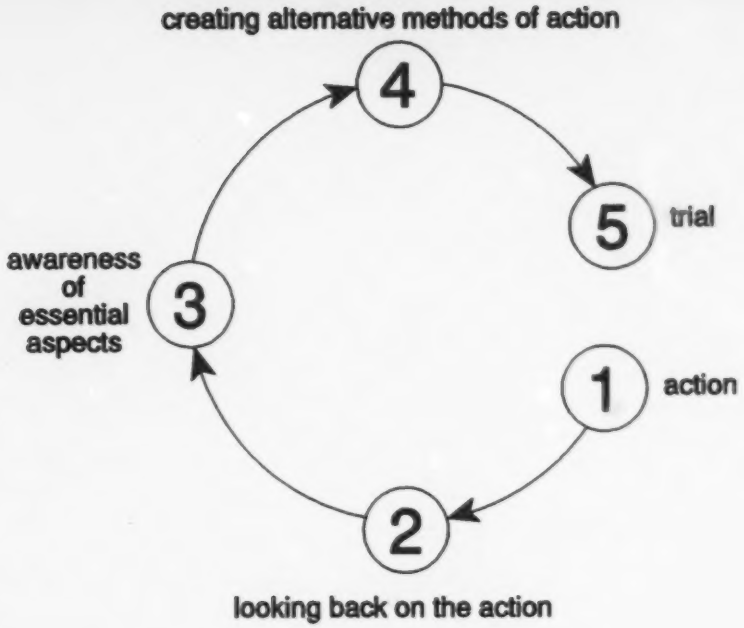

Figure 1: The ALACT-model

student teachers' behaviour is as much a reaction to the behaviour of the pupils as it triggers the pupils' next reactions (Wubbels, Créton & Holvast, 1988). This way of viewing classroom communication appears to be very helpful for teachers, as it facilitates their analysis of problems in the classroom. At the same time this way of reflecting about the interaction in the classroom is difficult to develop in student teachers, as they tend to be mainly focused on their own behaviour (Fuller & Bown, 1975). In order to develop their reflections, a scheme is used with 9 aspects (figure 2):

0. Context	
1. What did I want?	5. What did the pupils want?
2. What did I do?	6. What did the pupils do?
3. What was I thinking?	7. What were the pupils thinking?
4. How did I feel?	8. How did the pupils feel?

Figure 2: Aspects of reflection

The significance of this scheme lies in the relationships between the aspects, especially in the relationships between the two columns, as this relationship is essential within the system approach towards classroom communication. The final *aim* of the promotion of reflection is that the student teacher is able to analyze such relationships without the help of the teacher educator, thus having the competence to analyze interaction problems in the classroom indepently of a supervisor.

The Exeter Approach

The Exeter approach is based on a model of cognitive apprenticeship (Collins et al., 1988), which include four issues:

1. What teacher knowledge is to be taught to student teachers?
2. How is it to be taught?
3. How is the learning to be sequenced?
4. How is knowledge to be shared and negotiated?

Cognitive apprenticeship (Mandel & Prenzel, 1992) emphasises the following types of learning or strategic knowledge:

- The expert's heuristics - 'knowing how'
- Control strategies, especially monitoring and analyzing how one learns
- Adapting learning strategies in exploring new materials and extending and reorganising the knowledge base.

Teacher knowledge can be taught by the following strategies:
coaching, in which students are reminded of the important aspects, propositions are made and judged to be valid on evidence provided;
modelling, not only as teaching performance but also practice in describing, explaining and justifying actions, in conversations of instruction;
scaffolding, which refers to the whole of the help the tutor offers to support the learner in verbalising and externalising their thinking, represented in the Exeter model of instructional design and the criteria for argument;
articulation in argument, to examine student's principled pedagogical thinking, their practical reasoning;
critical discourse, that fosters comparisons between the learner's own learning strategies in justifying what they claim to have done and know.

Another theoretical basis on which the Exteter approach is built, is the work of Gal'perin (see for an overview Haenen, 1996). This has led to a learning cycle, located initially in actions, which are subsequently represented in speech and deep processing of information in terms of concepts and principles.
Learning is seen as operating through five stages (table 1):

1. Creating a preliminary conception of the action	2. Taking practical action steps	3. Talking about the action and its implications	4. Internalising the routine and potential implications of the actions	5. Consolidating and understanding through incorporating ideas into practice
e.g. introduced to one of the skills of teaching	e.g. an episode of teaching is set and exercised	e.g. provoked structured conversation relating the episode to skills of teaching	exploring, with co-tutor and university tutor the nature of new understandings, performance and how these are subsequently routinised into a repertoire of practice	

Table 1: Five stages of learning

There is a development from simple levels of performance to more complex expressions of competence. This is achieved through 4 planned phases of development (table 2):

Phase 1 Introduction	Phase 2 Moving towards autonomy	Phase 3 Autonomy	Phase 4 Working as a professional
The student working alongside the teacher, assisting and practising small episodes of teaching	Increasing student responsibility	Students planning independently and teaching whole lessons	Student operates as a fully autonomous member of the teaching profession

Table 2: Four phases of professional development

The central *aim* of reflection is to provoke conversation with oneself and with settings. Settings are structured situations with others as an audience. The conversation requires authentic practice experience as well as breaks with experiences. Conversations are structured mental processes and include an intermental (dialogue) and an intramental dimension (personal reflection). Both dimensions are strongly interrelated.
On the one hand, the conversation with settings is a rehearsal for conversation with oneself, it helps to have conversations with oneself to reflect. On the other hand, conversation with self is a rehearsal for conversation with settings.

The Trondheim approach
Teacher educators at NTNU consider the internship of student teachers in schools as an apprenticeship where the student teacher goes out and work with an experienced teacher in a master-novice relationship. In this school based training, there are various teaching skills that can not be taught, but only learned by doing. Not just at a superficial level but in an interactive process of action and reflection, resulting in a internalisation of behavioural competencies. Learning teaching skills could be compared with learning a craft where there exists a close cooperation between the master and the apprentice. Although each discipline has its own values, their ethics are similar.
Communication about the experiences of student teachers in their schools is critical for the development of a 'teaching craft'. The *aim* of reflection is to promote such communication, both through written and spoken language.

The Trondheim approach is based on a theoretical basis developed by Vygotsky. He considers language as an important tool for thought and problem solving. Thought is not merely expressed in words, it comes into existence through them. The thought becomes explicit when it is expressed in language. Through language we are able to examine thought, clarify it, explore contexts and solve problems or discover lack of connections. Language is not only the most important mode of communication, but also the most important aid in structuring and examining our inner and outer world.
Writing makes conscious, clarifies, saves the idea and makes it possible to develop it further, to restructure and discover new associations. It is a springboard for new ideas. Retrospective restructuring is very important with regard to the creation and maintenance of longer deliberations.

Inspired by Vygotsky, contemporary linguistic theory differentiated between two functions of language: language as a mode for thought and language as a mode for communication. It is important to keep in mind these two functions when one is using writing as a tool in developing thought. When one is writing to develop one's thoughts the receiver is oneself. Because of the exploratory nature of this kind of writing it will be fragmentary, spontaneous, and unfinished. When one is writing for someone else the aim is to communicate ideas, beliefs, and points of view. In this mode of writing, the text needs to have internal logic, be consistent and

grammatically correct. The two different functions of language also represent different relationships to the most important stress factor for writing, namely a critical reader. The student teacher's writing on e-mail to the teacher educator will often be exploratory and unfinished, and not always grammatically correct.

Even though student teachers are not likely to have so dramatic experiences during teaching practice that they are in the need of therapy, this period is full of new impressions and experiences, both positive and negative. The student teachers should be introduced to the different functions of writing and they should be encouraged to use writing as a tool in sorting out impressions in the reflection process, not just with a **reader** in mind, but with **oneself** in mind. As they gain experience in this way of working, they in turn will eventually be able to encourage their students to use writing as a tool to develop feelings into ideas, gain new insights and understanding in relation to themselves and the world.
In writing, the author enters into two kinds of dialogue. One is the dialogue between the author's inner being and the words that are put down on paper. The other is between the author and an external reader.

The Barcelona approach
The Barcelona approach is based on a somewhat different theoretical basis, which finds its origins in the work of Habermas (e.g. 1974) and was further developed by Van Manen (1977). It implies the acceptance of a particular ideology, along with its accompanying assumptions and epistemology (Gore, 1987; Wildman & Niles, 1987; Zeichner & Liston, 1990; Hatton & Smith, 1995). Within this ideology the emphasis is on the degree to which teachers critically reflect on the moral, ethical, political and instrumental values embedded in their everyday thinking and practice (Zeichner, 1983, 1987; Valli, 1992).

Van Manen (1977) identifies three levels of reflection. At the first level (technical rationality) the dominant concern is with efficient means for attaining a given objective. At the second level it is assumed that every educational choice is based on a value commitment to some interpretative framework. Reflection at this level is concerned with analyzing and clarifying individual and cultural experiences, meanings, perceptions, assumptions, prejudgments, and presuppositions, for the purpose of orienting practical actions. On the third level, the fundamental question of the value of knowledge is posed. On this level reflection is focused on the nature of the social conditions necessary for raising the question of worthwhileness in the first place (cf. Noffke & Brennan, 1988).

In the Barcelona approach reflection is considered to be more important than action. The main *aim* is to teach students to be critical thinkers, make them reflect on themselves as teachers, also in relation to their teaching tasks within the political context of education. Teachers should become aware of their functioning within a political system that has specific values and ideologies which it wants to be transferred into children's minds. Thus, the kind of questions the teacher educator asks are very important as they can draw the student teachers' attention to views of education, views of pedagogy and even views of society. This can only be effective within a respectful and safe relationship between the supervising teacher educator and the student teachers. Within such a relationship the student teacher can become aware of their implicit notions of education, teaching and learning, reflect on their experiences, discover whether theory meets practice, and define the links between the subject content and the historical and ideological implications of each experience.

Agreement on theory, working definition and research question in the REFLECT project
As far as the definition of reflection is concerned it has become clear that the partners share

interesting similarities in their views and activities related to reflection and that their theoretical perspectives are complementary to each other. Exeter, Trondheim and Utrecht have much in common, whereas Barcelona contributes to the discussion from a different vantage point. This difference with Barcelona stems from various elements such as the educational system of teacher education in Spain, the specific field of Arts Education and the political history of the Spanish partner.

Due to the collaborative involvement of all participants, the partners have gone far beyond an exchange of ideas. The sharing of the different theoretical perspectives has led to an important result viz. a first agreement of the four partners on a working definition of reflection for the REFLECT project. This definition, developed by De Jong and Korthagen (1989) is:

> *Reflection is the mental process of trying to structure or restructure an experience, a problem or existing knowledge or insights*

However, it must be said that this definition is responsible for a vivid discussion all along the project. On the one hand, the label 'mental process' may appear difficult to handle as it is a process that is going on in one's mind, and, as a consequence, can't be seen by any researcher. On the other hand, the 'mental process' may be interpreted as a process of thought. If it is agreed that thoughts can be expressed through writing, and writing is a way to open up inner resources and a way to bring ideas to the surface, as in the view of the Norwegian partner, the definition may well provide a framework for analysis of data in the form of written words.

The partners have also agreed upon the usefulness of the ALACT model (see above) as a possible tool for the development of reflective skills of student teachers. One of the goals of the REFLECT project is to study the usefulness of such tools in tele-guidance. Within the project, Utrecht and Trondheim currently also use the ALACT model as the basis of an instrument for measuring the quantity and quality of student teachers' reflections.

Finally, the REFLECT partners have agreed upon a common research question driving each of the case study reports that will be published by September 1996. The various modes of telematics used by the four partners offer four different conditions in which the content of the discourse and the nature of the interactive processes through interventions are subsequently examined. The agreed definition of the research question is as follows:

> *What is the content and nature of discourse (related to the promotion of reflection) in different modes of telematics in teacher education?*

This question gives a common frame to the partners' case studies and at the same time offers opportunities to differentiate according to the specific contexts of the partner institutions. They can easily focus on supplementary questions and issues.

3 THE TELE-TUTORING CASE STUDIES

The four modes of telematics used by the partners vary from one-to-one communication using video conferencing facilities (Exeter) and one-to-one computer mediated communication (Trondheim and Barcelona) to many-to-many computer conferencing as used by the Utrecht partner. All tele-tutoring activities are embedded in regular teacher training programmes. Some partners are using telematics as a first experiment, others are building on former experiences.

A variety of data sources has been used: from interviews, group discussions with teacher trainers, observations of supervisory meetings or conferences with student teachers, to structured and open questionnaires, analyses of actual on-line behaviours of participants and analyses of e-mail messages.

The Utrecht Case

In the Utrecht case study, 30 foreign language, history, musical art and geography students participated. During a three-month school-based training period, student teachers are responsible for about 12 class periods a week, which they have taken over from the co-tutor at school. Tutors and student teachers participated in a listserv for each of the groups of students and were equipped to be able to communicate from their homes.

Reflection on action is stimulated through diaries and reports, monthly supervisory meetings at the university and meetings with the co-tutor. On the one hand, the use of telematics supplements regular tutoring by the university teacher and the co-tutor at school. On the other hand it enhances communication between group and individual guidance. It is not a substitute, although some teacher educators have reduced the frequency of the supervisory meetings.

Students are prepared for the electronic discussion through technical training, training on intervision skills and shared decisions on the frequency and nature of the e-mail messages to be sent. The students are expected to log in at least three times a week to read each other's messages, and they are to write one message a week reflecting on action according to three specific questions:

- what happened? (phase 2 of the ALACT model)
- what does this experience mean? (phase 3 of the ALACT model)
- what do I intend to do next time? (phase 4 of the ALACT model)

In addition, students are to react at least once a week to a peer student's message, using a pre-trained strategy of intervision.

The Utrecht case study focusses on two specific research questions:

- how does student teachers' reflection develop in a computer conferencing environment?
- how does the teacher educator's role evolve during tele-tutoring?

The research focusses on the development of two instruments, one for the measurement of reflection and another for categorizing the interventions of teacher educators. Sofar, the first instrument has been developed in a prototype form. The second instrument will be developed in the second half of 1996.

Data have been collected using e-mail messages from students and tutors, student reports of school practice, diaries, structured pre and post questionnaires, interviews, video tapes of supervisory meetings, audio tapes of meetings of tutors discussing the activities within the computer conferences.

The Exeter Case

In Exeter supervisory conferences between university tutors and students on teaching practice are conducted using video conferencing facilities. This enables face-to-face discussions to take place as well as the sharing of onscreen software, documentation, video still pictures and videos. The conferences are prepared by the students as well as by the tutor. Evidence of a teaching episode and its related early analysis is sent in advance to the tutor who then also has to prepare for the conference. Participating students all were given courses in computing to include email and the Internet. In addition, they were trained theoretically in using 'argument', 'the skills of teaching' and 'the instructional design' Data of two maths students, placed at schools in North Devon, and who took part in the project have been analysed in detail.

The Trondheim Case

This case study is focusing on advising students on teaching practice on a one to one basis using email. Student teachers are at a considerable distance of one-day travelling from the university site, which make face-to-face communication difficult to realize.

A group of history and language students took part in the research and were trained in using their portable computers and Eudora software, provided by the university. A telephone helpdesk was set up to support students who had problems using their computers. Besides this, the students were trained in writing as a tool for the development of thought. It was important that the students should understand that email communication is strictly an aid to think and reflect and therefore different from writing to communicate (see par. theoretical framework - the Trondheim approach).

The tutors formulated their responses to descriptions of the student's own teaching in such a way that students were pushed along the ALACT model, to identify the principles involved and planning alternative strategies that they try out and so on. Careful formulation of questions and responses sought to create a kind of scaffolding for students to climb to a higher and more sophisticated level of thinking and reflecting over their own practice.

The Barcelona Case

This case study is focusing on a group of art students on the initial teacher education program. Student teachers spend three months in schools and observe in the classroom of their mentor. Most of their time is spent on discussions on school organisation, goals and resources of the department of art education and planning and organising some teaching. The Spanish initial teacher training does not have a long tradition in school based training. It is only one year ago that school practice is being discussed and integrated into the curriculum. Until now, visits to schools have been focussed on discussions on educational systems instead of personal classroom experiences.

Eight participating students received training in using Eudora and the Internet. During the project the students could rely on help from a technical assistant.
Unlike the other partners in the project, the Spanish students did not get training in reflective writing as this was seen to be constraining and would affect the nature of the reflection. Students had one-to-one exchanges but started to organise their messages co-operatively. Although the total number of messages was restricted the messages were long and encompassed a week's events and discussions.

At the time of writing all partners are analysing the data collected from the student teachers and teacher educators. Therefore, only first observations and preliminary findings can be given below.

4 PRELIMINARY OBSERVATIONS AND FINDINGS OF THE CASE STUDIES

Dutch observations

From the Dutch experiences some pedagogical issues emerge, which seem to be relevant to telematic learning environments.

1. An established organisation of the exchange of messages appears to be a critical conditional determinant for a well functioning computer conference.
   Tutors and student teachers should agree on the minimal frequency, on how to give feedback, and on the contents of the messages sent. Agreement requires preparatory training in intervision skills enabling student teachers to react effectively to each others' messages. Clarity of expectations on what kind of information and how it should be communicated refers directly to the theoretical framework used.

2. The electronic discussions evolve in subsequent developmental stages of students' concerns. Tutors should be aware of these stages of concerns and react accordingly, using pedagogical strategies.

One pedagogical strategy running through all stages is empathy: the tutor reacting positively to the students' emotional feelings. Depending on the stage of the electronic discussion, the tutor should add scaffolding strategies that help the students to structure and focus their experiences by questioning and by inviting students teachers to relate their experiences to theoretical backgrounds.

Stages in electronic discussions and corresponding strategies of tele teacher trainers			
	Stage 1	Stage 2	Stage 3
Characteristics of messages	Messages raise a wide variety of issues	Messages are better structured and focus mainly on the student teacher's view	Messages tend to focus on negative experiences and ask for simple and quick solutions
Pedagogical strategies	Show empathy Mirroring - summarizing the wide variety of issues raised Coaching - helping students to focus on specific experiences and questions	Show empathy Scaffolding - helping to incorporate the learner's view by referring to the used reflection model	Show empathy Stressing positive experiences as valuable learning experiences Inviting students to describe the negative experiences and find as many alternatives as possible

Table 3: Observed developmental stages in an electronic discussion

3. Computer conferencing seems to thrive most in a mixture of pedagogical methods, such as supervisory meetings at the university site, telephone calls, and the use of diaries.
This statement only applies if a mixture of methods is at all possible. However, in countries where distances inhibit face-to-face meetings, the next best option of using video conferencing should be considered at an early stage. All these methods should be related in a synergetic way. In particular, the face-to-face meetings offer the opportunity to elaborate on what has been discussed electronically, recall theoretical issues and prepare for further electronic communication.

4. Computer conferencing offers one mode of communication (many-to-many) but should be complemented by the use of other modes to enhance flexibility in interpersonal communication.
Although the listserv facility is meant to serve a group discussion, student teachers as well as teacher educators do use electronic mail for one-to-one communication and for small group working.

5. Two areas appear to be relevant for interventions: that of content related pedagogy and
The latter occurs most frequently as student teachers often discuss classroom management in their messages. Here, the interventions of tutors concentrate on helping students reflect on their classroom experiences according to the used model of reflection.
The area of content related pedagogy comes in when students leave the first experiences behind. Tutors help their students to refer to specific pedagogical approaches to be used or give hints for reading materials that might be useful for classroom practice.

6. Teacher educators describe the added value of computer conferencing in five major functions:
   - the monitoring function: watching messages pass by, tutors were able to monitor the progress of their students and felt more involved with their students.
   - the tutoring function: 1-to-1 communication definitely enlarged tutoring possibilities

- the spotting function: the listserv offered the opportunity to spot at an early hour students' interpersonal problems in the classroom
- the intervision function: student teachers learned from the exchange of their mutual experiences and comments
- the social function: students continue to function as one group and feel moral support from the electronic discussion.

Exeter observations

The analysis of tutor and student interviews to date have produced some interesting findings that seem to indicate that these conferences are not exact replicas of those conducted on the school site. The students have to bring the context of the school and classroom to the conference and with the tutor being located at the University there is more likelihood of the analysis going beyond performance into theoretical generalisations. Both students and tutors find the sessions quite intensive and exhausting. Despite this, there is a tendency for the participants to get so engrossed that sessions overrun the recommended maximum length of 40 minutes. Some of the comments to date relate to the following issues.

1. Conversations appear to be less about performance and more about analysing the teaching of the subject. Comparing conversations on the school site to those by video conferencing, the former are often high in context and low in generalisation whereas these video conferences are proving to be high in generalisation and lower in context. In addition to this, rather than merely discuss ways of improving specific episodes of teaching, students are able to look at hypothetical models outside experience and use revised thinking for their future teaching.

2. As far as the preparation of the supervisory conferences is concerned, student teacher preparation for the video conference is sometimes better than in face-to-face meetings because you cannot rely on looking for material whilst on-line. Tutors have found that they have to be prepared using the notes provided by the student to make best use of the time.

3. Because the tutors have not attended the lessons the students are forced to describe, explain and justify their work for themselves rather than relying on evaluation by another. Working on the students' own evaluations provides the tutors with improved opportunities to challenge the thinking of the students. The tutors are not judging the sutdents on what has been seen but are provoking analysis on evidence provided by the students.

4. In addition to these findings there have been significant difficulties for the students to use the video conferencing software. Although the students had been trained in the use of the software, there has been a time lag between training and use. Students did not have have the opportunity to routinize the use of the software, which was exacerbated by the infrequency of use in school. Students made contact with their tutor only fortnightly, or monthly. Students and tutors find this lack of familiarity restrictive, and inhibits the natural flow of a conversation.

Trondheim observations

Although this is only the pilot stage of the project, some important observations have been made with regards to the kinds of questions and response that help push the student teachers up the scaffolds to a more sophisticated way of thinking and reflecting.

Some of the interactions with a few of the student teachers have caused them to move to a higher level of reflection according to the ALACT model. In the instances concerned, the focus has been on a small aspect of teaching. For example, one of the tutors has had several highly sophisticated series of interactions with one of her students regarding the teaching of literature. Another tutor had the same experience with one of her students about how to engage silent students in class discussion. These interactions were focused on the content and concrete activities in the classroom, some of them going all the way around the ALACT model.

With regard to the analysis of data it has been observed that instead of each e-mail message being seen as one 'chunck' to be coded, there are now a series of messages: student, tutor, student, tutor and so on, a stream of messages all of them about one episode. This implies that tutor's responses have become part of the data and have to be analysed in terms of what level of thinking and reflection it induced in the student teacher.

Barcelona observations

Some preliminary findings from the Barcelona case study include:

1. Telecommuncations is a very demanding task for supervisors and tutors.
2. Reflection is connected with the 'tune' of the conversation as an interaction. E-mail exchanges make 'conversations' difficult - they are only possible on an everyday exchange basis.
3. Writing fixes the discourse and promotes students' self reflection.
4. Tutors and students have materials for assessing the quality of students' educational experiences.
5. Students find it possible to participate in discussion with peers, mentors and supervisors. In addition, they feel free to speak about difficult issues like feelings, attitudes and social problems.

5 CONCLUSIONS OF A SURVEY ON EUROPEAN RESEARCH ACTIVITIES ON REFLECTION AND TELEMATICS

Within the REFLECT Project a survey has been carried out, providing an overview of European research activities in the field of reflection theories and telematics in teacher education. Using the ATEE guide (Buchberger, 1992), a semi-structured questionnaire has been sent to all (700) European teacher training institutions. The response to the questionnaire has been low, almost 10% of the population. This result may be due to the fact that the addresses did not include names of persons within the training institutions and specifically for Germany, the addresses only mentioned universities without mentioning an educational department.

However, the respondents showed a great interest in the field of research. Among the respondents 16 institutions, from 9 European countries, appeared to pursue research activities in the combined field of reflection and telematics. The activities are mainly organised within projects, half of them being funded externally. Projects concerning reflection and telematics are relatively new activities. The first project started in 1994. In table 4 an overview of the year the projects have begun, is shown.

Year	Number of projects
1994	5
1995	2

1996	5
unknown	4

Table 4: year projects started (N = 16)

Although in the period from 1994 until 1996 there is a difference in the number of new projects, the number is too low to draw conclusions. The last project started in March 1996. At this moment, none of the projects has been finished yet. The first project will be finished during 1996. The expected average duration of a project is 21 months. The variation in duration is minor. Most of the projects can be placed in the interval 23 to 29 months.

Although the questionnaire asked for only the number of colleagues involved, the respondents have given other parameters to express the scale of the project. In table 5 an overview of the most mentioned parameters is given. One of the parameters is the number of institutions, which refers to the participating schools or universities. The total number of respondents in table 4 is 12; 4 respondents did not answer the question. Empty boxes in table 5 mean that no information was provided.

project	researchers	teachers	students	institutions
1	18			4
2	15	60		
3				11
4		15	90	10-15
5	11	12		
6				6
7		8	30	
8	1	10		10
9	3			
10	1		20	
11			10	
12	5			2
total	54	105	150	43-48
average	7-8	21	37-38	7-8

Table 5: Scale of the projects (N = 12)

The figures in table 5 give only an indication of the size of the projects. The number of projects is too limited to draw conclusions. In the average project 7 to 8 researchers are involved and the number of student teachers educators or supervisors is 21. In an average project almost 40 students participate and 7 to 8 institutions, as schools or universities are involved.

The last parameter is whether the project is externally financed. This is the case for 7 projects. One project receives a contribution from industry. One project is funded by the national government. Five projects are financed by the European Committee. The mentioned departments

are DGXII, DGXIII and DGXXII. The relevant programmes are Socrates and Erasmus. Two respondents state that their project is not yet externally financed.

In addition to the survey, a literature search was done into the uses of telematics to promote reflection. The ERIC-database and ADION, a national database, as well as a search on the WWW, were used to search for relevant publications. Additionally, five relevant teacher education journals were scanned. The result of the exploration included 33 relevant references.

The general picture offered by the literature is that research on reflection is generally carried out by analysing data from sources meant to stimulate reflection such as logbooks, recorded supervision meetings, interviews and other qualitative data. In this respect telecommunications is seen as a new aid to help student teachers to reflect on their teacher behaviour. During school based practice, telecommunications facilities offer additional opportunities for individual student teachers to share their experiences with peers, get responses and communicate more frequently with their university teacher.
Von Wright, 1992 and Brown & Palincsar, 1989) refer to the role of reciprocal teaching in learning processes. By reading reflective writings of colleagues and by thinking about how to react, reflection on one's own experiences are strongly stimulated. Von Wright puts it as follows: 'Trying to understand another person's point of view forces one to reflect on one's own'.
Von Wright also mentions advantages of social support and shared expertise.

Wolcott (1995, p. 40) has a quite negative view on the opportunities of the use of telematics. In his opinion the result of the use of telecommunications will be an increase of the interpersonal distance. This refers to the decrease of feelings of psychological closeness as one moves from an information rich environment, such as face-to-face interaction, to an information environment where sensory channels have been reduced. Wolcott states that the amount and frequency of interaction will decrease. In relation to the feedback in interaction processes, Wolcott refers to the absence or reduction of nonverbal communication, such as eye contact and body language. His conclusion is that without nonverbal cues and with feedback diminished, there is a greater likelihood that messages may be misinterpreted.

Wolcott's view may be right if the objective of the use of telecommunications is to substitute the existing educational practice. Although in theory this is a possibility, in practice the introduction of new technologies often implies that new opportunities to act are added. In relation to reflection the result of using telecommunications can be the decrease of the interpersonal distance. This situation can occur in cases where the possibilities of communication are limited, because of the existence of a physical barrier.

Results of evaluation studies of projects using tele-guidance and reflection have been scarce until now. However, interesting observations have been made, some of them we would like to review here.
Hatton and Smith (1995) conclude in their study that there are differences between reflection processes apparent in group discussions and the written texts from participants. Some people show a high level of reflectivity in such discussions, but are not inclined to write much in their logbooks. Telematic aids may offer such students a more attractive alternative. In this context, the research of Newman, Webb and Cochrane (1996) can be referred to, because they have compared face-to-face learning processes and computer teleconferencing in general. They found evidence for critical thinking, both in the conference and in the regular seminar. Although similar depths of critical thinking occurred, there were differences. In the face-to-face seminars more new ideas emerged. At the same time, more important statements were given and more ideas were linked in the computer conference.

Harrington (1992) introduces the variable non-dominated dialogue. In her view, an advantage of the application of telecommunications in comparison with face-to-face discussions is that each voice is assured equal value. "The opportunity that computer conferencing provides to focus on what is said, rather than who says it, takes power away from the quick, articulated responses that often dominate classroom discussions." (Harrington, 1992, p.72). This is realised by giving anonymous identification numbers to the participants. Another advantage, she mentions, is the amount of time. Computer conferencing provides student teachers with more time for reflection. The assumption is that in classroom discussions the opportunity to think through the consequences of others' opinions is more restricted. Besides this advantage, computer conferencing enables student teachers to confront different points of view. Harrington's conclusion is that computer teleconferencing appears to have potential for improving reflection of student teachers. In spite of this some questions have remained unanswered. One of the main questions is the relationship between tele-conferencing and taken-for-granted assumptions.

Blanton (1993), take the establishment of a virtual community of student teachers and university supervising professors as a critical variable. The idea is that through the use of telecommunications an electronic network can be created. This can solve the problem of poor communication between the members of the student teaching triad (university supervisor, cooperating teacher and student teacher). A frequent result is a lack of understanding of each other. In addition, student teachers seem to lack opportunities to engage in reflective activities. In this respect telecommunications is potentially a powerful tool for creating the social context for active, goal-oriented professional behaviour. It removes the boundaries of time and distance in communicating.

In Blanton's view, telecommunications may enable participants to:
- reflect on their learning,
- use writing as a tool for both communication and thought,
- constitute social structure for the critical analysis of teaching and reflection,
- communicate about jointly addressed teaching problems,
- mediate activity on learning to teach at distances in non-real time,
- compare experiences with others,
- access networks and information sources,
- interact with specialist,
- and to become less isolated.

In his project the electronic network is used together with traditional supervision. After a description of several dialogues among the participants, Blanton states that a socially organised group can offer both support and advice. Blanton emphasizes the possibility of receiving more answers to a question. In the current situation a student teacher gets an answer from one person. As a result the process of the construction of meaning takes another course. At the same time the use of telecommunications serves as a self-help device to student teachers. Although in his view the results are promising, he states that it is too early for conclusions. He advocates a further exploration of the possibilities of this technology in this area.

We may conclude from the literature that the uses of telematics provide a potential tool to promote reflection. However, although the above conclusions are of interest for researchers, few indications can be found providing helpful ingredients for an approach aiming at the promotion of reflection. As a consequence, research is needed in order to define the specific potential of this medium.

Summarizing the results of the inventorial study, the following conclusions may be drawn:

1. There is great interest in Europe in the use of teleguidance in teacher education to promote reflection. Responding to the questionnaire, at least 64 teacher education institutions have expressed this interest.

2. The number of institutions themselves actively involved in activities focusing on reflection and tele-guidance is much lower, viz. 16. (The 4 REFLECT project partners were not included.)

3. Many of the initiatives on reflection and tele-guidance are at a beginning stage. Only 5 projects have been identified that are more than two years old.

4. As yet, there is little evidence and hardly any substantive empirical data available on the effects and effectiveness of the uses of teleguidance in teacher education.

5. The theoretical frameworks underlying the identified initiatives vary to a large extent and need more elaboration. Basic concepts, such as reflection, are generally ill-defined and operationalized.

6. Nine countries are involved in different networks concerning reflection and/or teleguidance, viz. Belgium, Denmark, Finland, Italy, the Netherlands, Spain, Sweden, Switzerland, and the United Kingdom. It is remarkable that there is little cooperation between the projects of these countries.

7. Out of the 16 projects focusing on both reflection and teleguidance in teacher education, only 7 institutes are involved in a European network.

8. In order to improve collaboration across EU member states, there is an urgent need to establish a comprehensive European thematic network in this field. Such a network could avoid re-inventing the wheel, at different non-related institutions in Europe.

9. A coordinated agenda for research is needed for those institutions who have expressed their interest in future collaboration in research on reflection and teletutoring.

10. More empirical research is needed into the effects of teleguidance. This research should be based on a strong theoretical basis and valid and reliable operationalizations of concepts.

11. The development of a pedagogy of technology-enriched distance learning in teacher education is a blank on the research map. Until now, current projects seem to have focused mainly on technological issues rather than on the nature and quality of teaching and learning processes involved in teleguidance. It is fundamental to the quality of teacher education in Europe that a pedagogy of distance learning be developed.

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